

Comments Related to Ethanol

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Smog Reyes

Four Topics

- Carbon Monoxide Emissions
 - Linearity and Response to Fuel Oxygen
- Carbon Monoxide Reactivity
 - MIR or SIP Conditions
- Nitrogen Oxide Emissions (no E10 use)
 - New Vehicle Response and Higher Emitters
- Permeation
 - Remaining uncertainties

Carbon Monoxide Emissions

- ARB claims CO partially reduced in non-oxy fuels
 - Data on actual in-use fuel properties indicates minimal impact
 - NSTC (1997) recommends linearity with oxygen, but ARB claims very non-linear
 - Predictive Model uses zero Tech 5
 - “Fixing” with Alliance data implies 22 percent CO increase for non-oxy fuels from flatline.
 - ARB claims only 3 percent CO increase.
 - If E10 were the flatline base the non-oxy increase would be 46 percent.

Data on fuel properties indicates minimal impact

- ARB data show non-oxy fuels used reduced RVP to pass as CaRFG
- ARB data do show more olefins sometimes, but Auto/Oil study shows CO response to olefins not significant.
- ARB data do show somewhat less sulfur, but E5.7 fuels are already low and Auto/Oil study shows less CO response than HC.

ARB claims very non-linear CO

- ARB claim is based on two factors
 - Predictions that non-oxy fuels would not use RVP, but recent ARB data show this is false.
 - Lack of aggressive driving data below 2 wt. percent oxygen, but US06 data should become available on Tech 5 from Alliance.

Carbon Monoxide Reactivity

- **U.S. EPA Recommends 15/1 VOC to CO**
 - After studying UAM SIP grid-model simulations of Chicago, New York, and South Coast
 - EPA concluded MIR ratio of mobile VOC to CO too high. (66 **FR** 37156, 17 July, 2001)
- Predictive Model uses MIR to gives 48 to 1
 - Newer MIR values imply 59 to 1
 - UAM (with EPA analysis) gives 15 to 1
- MIR's based on high NO_x box-model
 - SIP conditions in grid-model show lower ratios.

Nitrogen Oxide Emissions

- Current Predictive Model assumes new Tech 5 (94+) vehicles have same high NOx/oxygen as older Tech 4 ('86-'94).
 - However, new (Alliance) data show little effect of oxygen on NOx (may even be negative)
- New techniques applied to NOx database indicate lower NOx impact from Tech 4 than current Predictive Model treatment.
- Current Model prevents E10 use.

Permeation

- Remaining uncertainties even with new CRC study.
 - ARB used CRC data to estimate 75-95 tons per day from ethanol.
 - ENVIRON used same data to get 19 tons.
 - AIR, Inc. used same data to get about half of ARB estimate.
 - CRC data do show newest cars half of older